

Investment Office Roadmap

Organization Systems & Controls Update for Investment Committee

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February 14, 2011

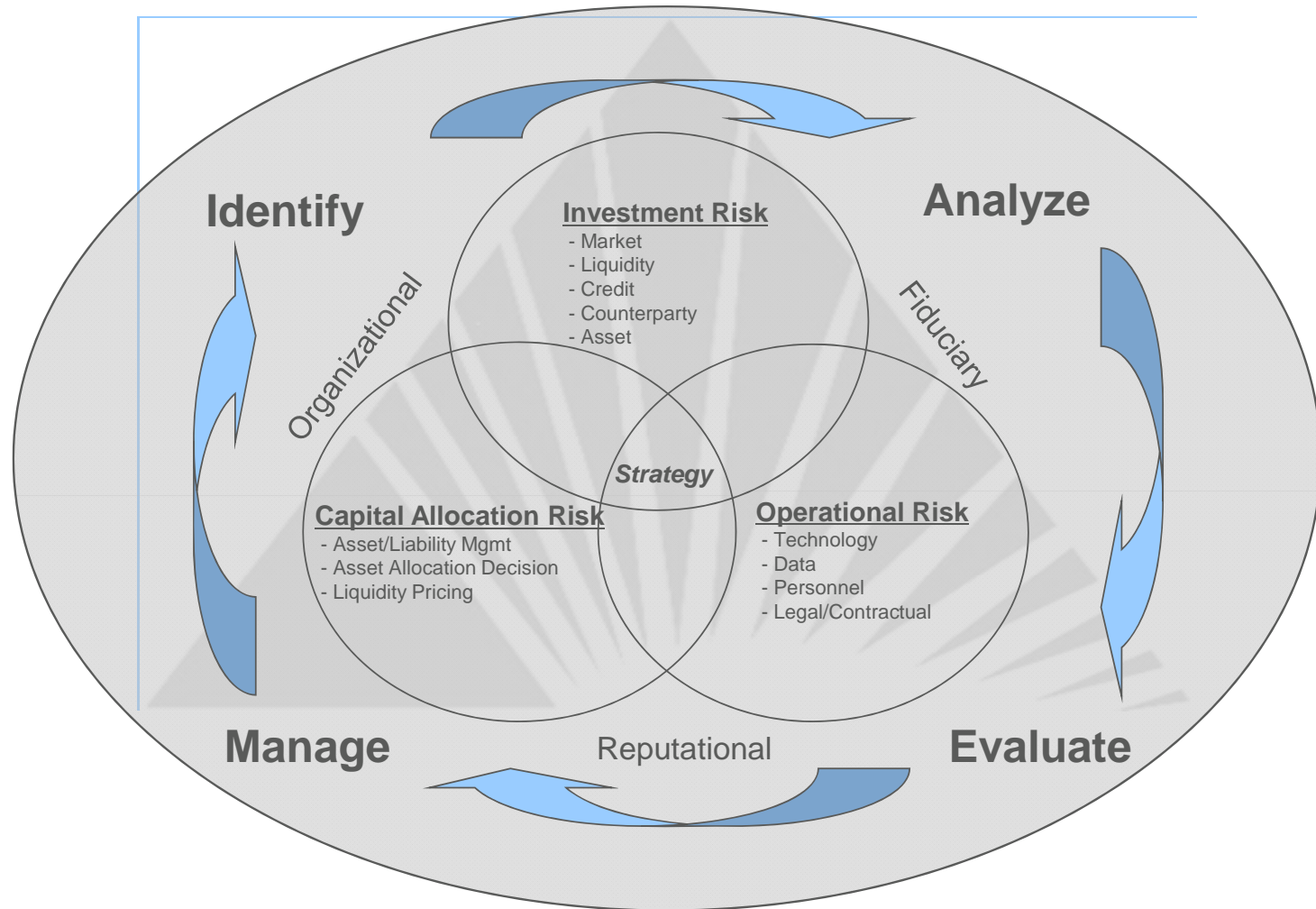
Context

- Prior to 2010 – Investment program grew rapidly in scale and complexity ahead of Investment Office infrastructure
- 2010 – Build foundation for a strong control environment
 - ✓ Risk Framework
 - ✓ Governance
 - ✓ Risk Assessment
 - ✓ Target Operating Model
- 2011 – 2013 – Deliver asset management industry standard infrastructure and controls
 - ❑ Roadmap/Strategic Programs
 - ❑ Capabilities
 - ❑ Measures

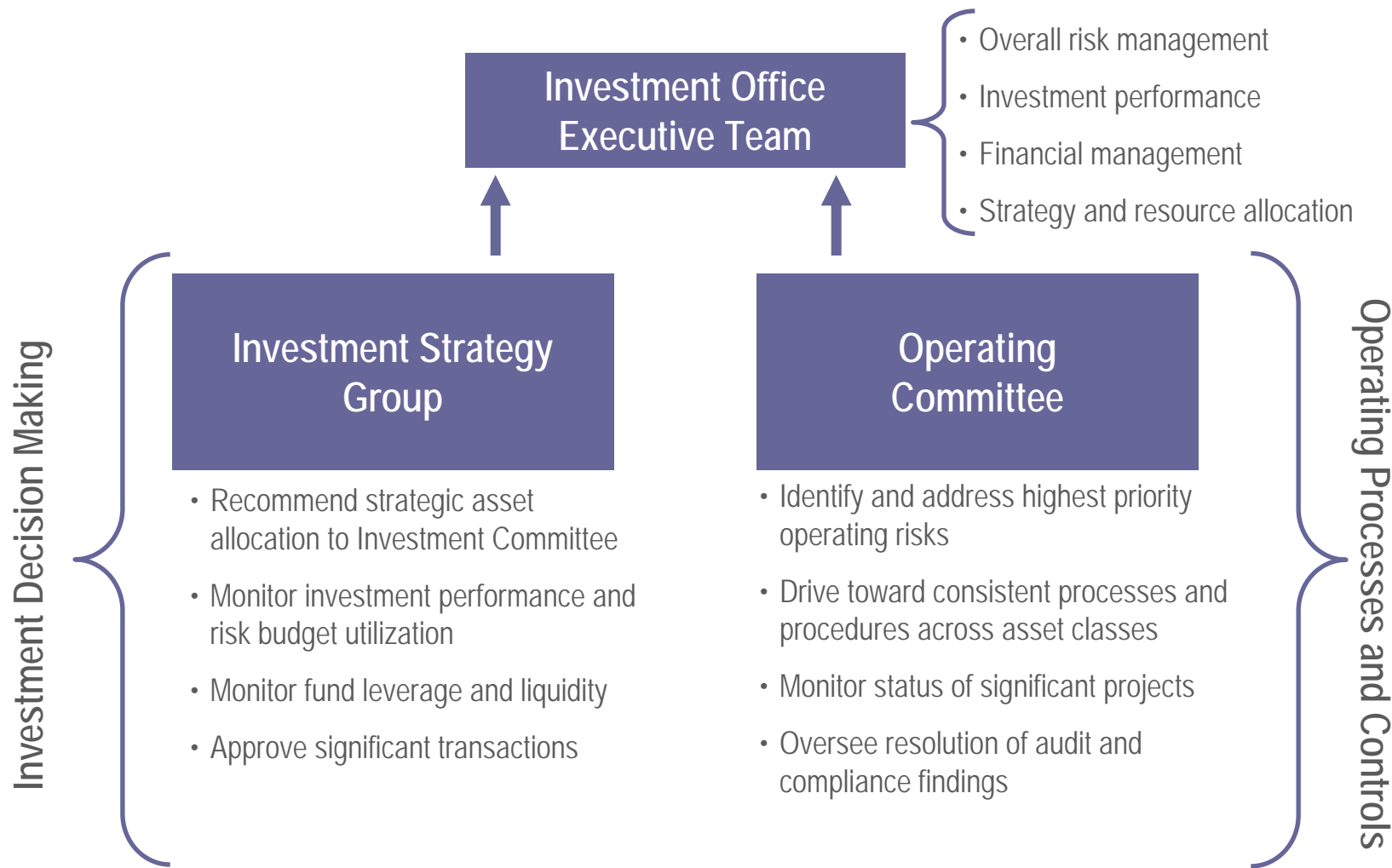
Today's Agenda

1. Update the Investment Committee on outcome of Investment Office heat map
 - Top INVO risks
2. Update the Investment Committee on Target Operating Model design
 - Gaps from industry best practices
3. Review Organization Systems and Controls Roadmap
 - Prioritized list of major initiatives
 - Capabilities needed

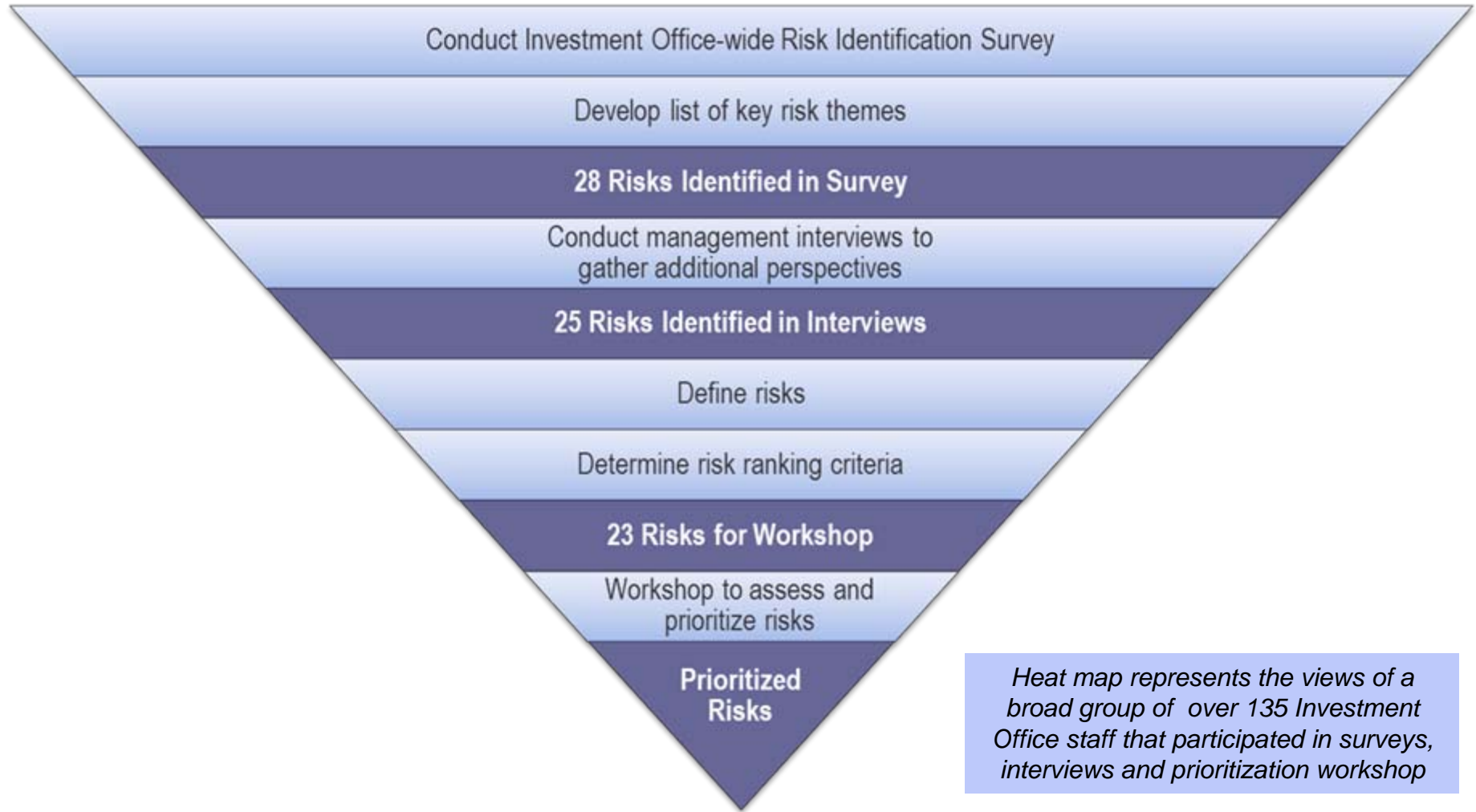
Investment Office Risk Framework



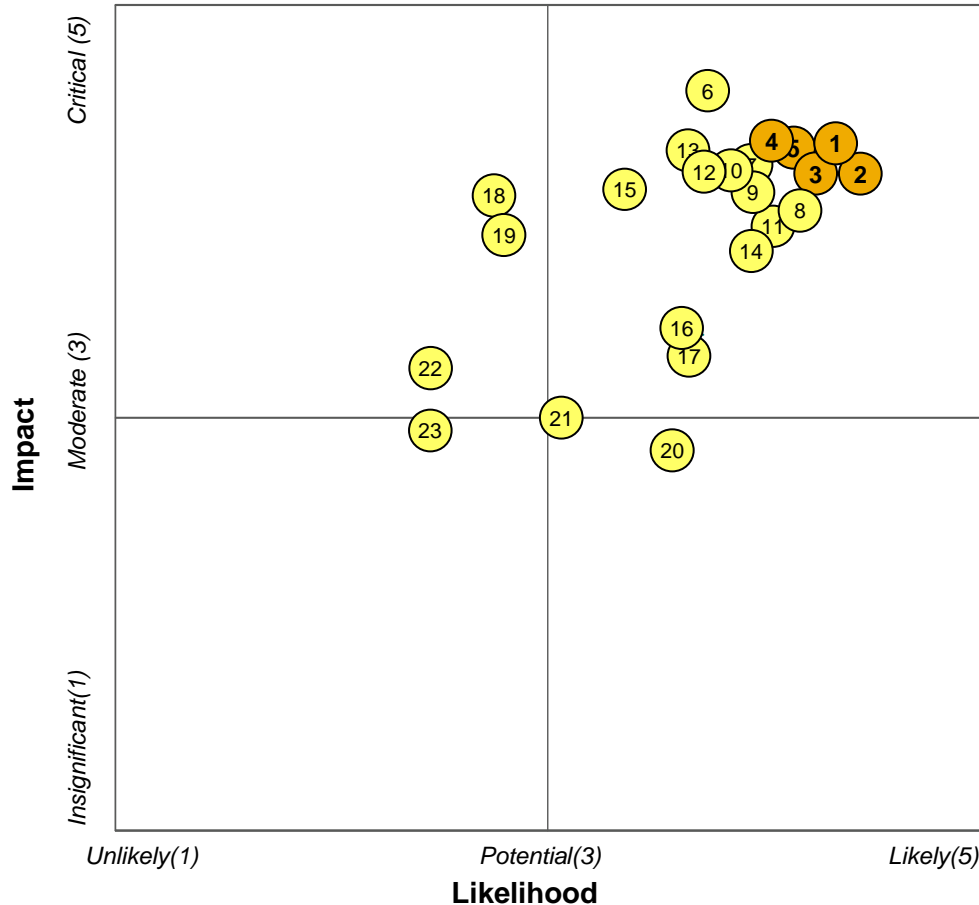
Investment Office Governance



Risk Assessment/Heat Map Process



Risk Assessment/Heat Map Results



Risk Name	
1	Data Integrity
2	Portfolio Data & Analytics
3	Control Environment
4	Ext. Manager / Partner Selection, Monitoring & Rights
5	Governance / Stakeholder Support
6	Market / Systemic
7	Investment Decision Process
8	External Influence
9	Business Model
10	Skills & Capabilities
11	IT Infrastructure Adequacy
12	Leadership / Direction
13	Asset Allocation Strategy / Portfolio Structure
14	Recruiting & Retention
15	Liquidity
16	Incentive Alignment
17	Contract Management
18	Funding Status
19	Ethics / Fraud
20	Institutional Knowledge
21	Interest Rates
22	Counterparty
23	Currency / Foreign Exchange

NOTE: See appendix for Risk definitions and definitions of Impact and Likelihood rankings.

Risk Governance

Investment Strategy Group	Investment Office Exec	Operating Committee	Operating Committee	Board / CalPERS Leadership
Investment / Capital Allocation	Human Capital	Information Management	Operational	Strategic / External
External Manager / Partner Selection, Monitoring & Rights	Skills & Capabilities	Data Integrity	Control Environment	Governance / Stakeholder Support
Market / Systemic	Leadership / Direction	Portfolio Data & Analytics	IT Infrastructure Adequacy	Market / Systemic
Investment Decision Process	Recruiting & Retention	Institutional Knowledge	Contract Management	External Influence
Asset Allocation Strategy / Portfolio Structure	Incentive Alignment / Structure		Ethics / Fraud	Business Model
Liquidity				Funding Status
Interest Rates				
Counterparty				
Currency / Foreign Exchange				

Target Operating Model drills into detail on these risks

Note: Shaded areas represent top five risks.

Target Operating Model

Target Operating Model = People, Process, Technology

What functions does the Investment Office perform?

- Functions/Activities

What tools and information do people use to accomplish tasks?

- Technology
- Data

How do people complete tasks?

- Processes
- Controls

How are people organized and how do they interact?

- Organization Model

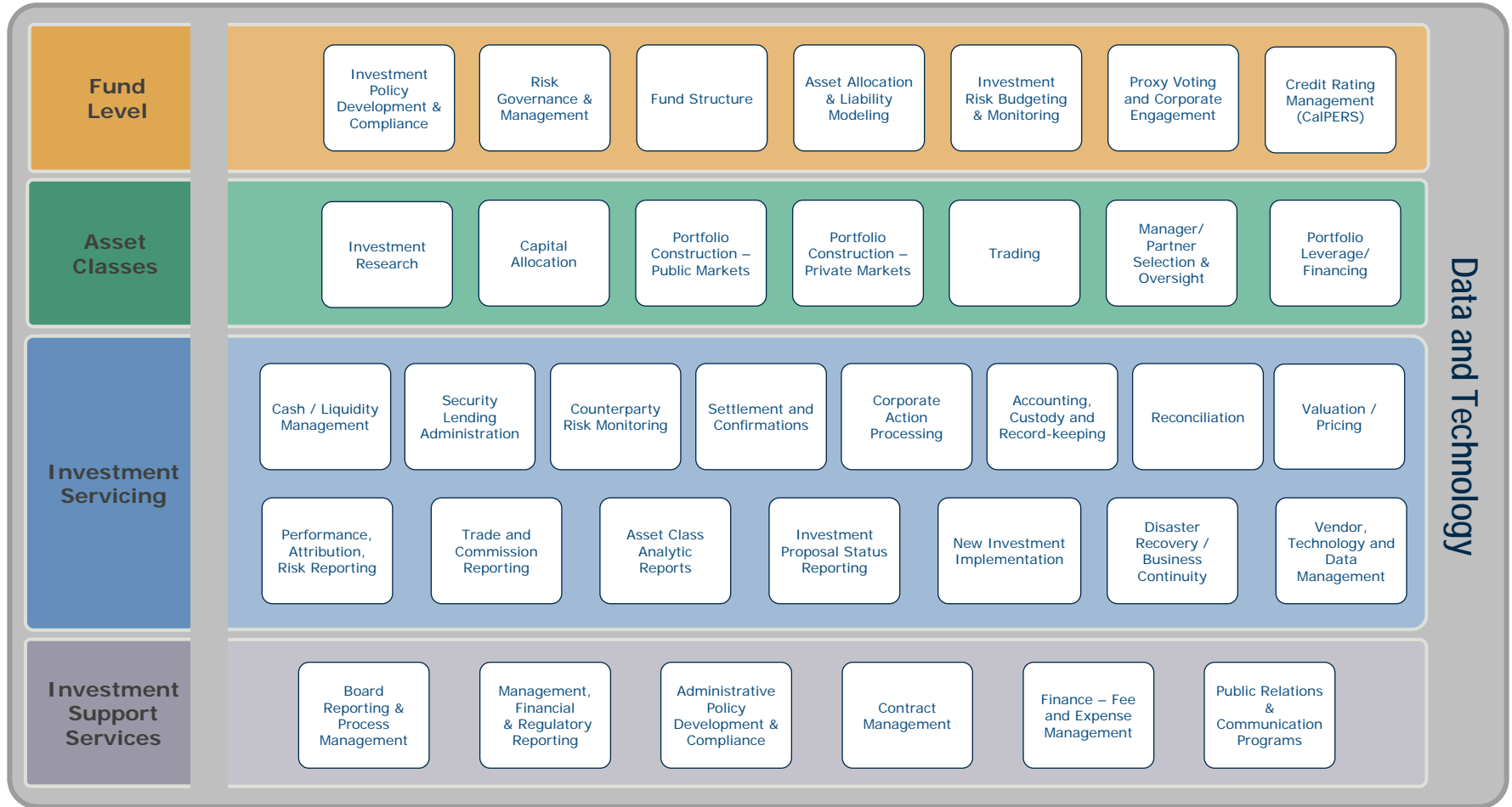
Who does the work?

- Roles/Responsibilities
- Insourced/Outsourced Providers

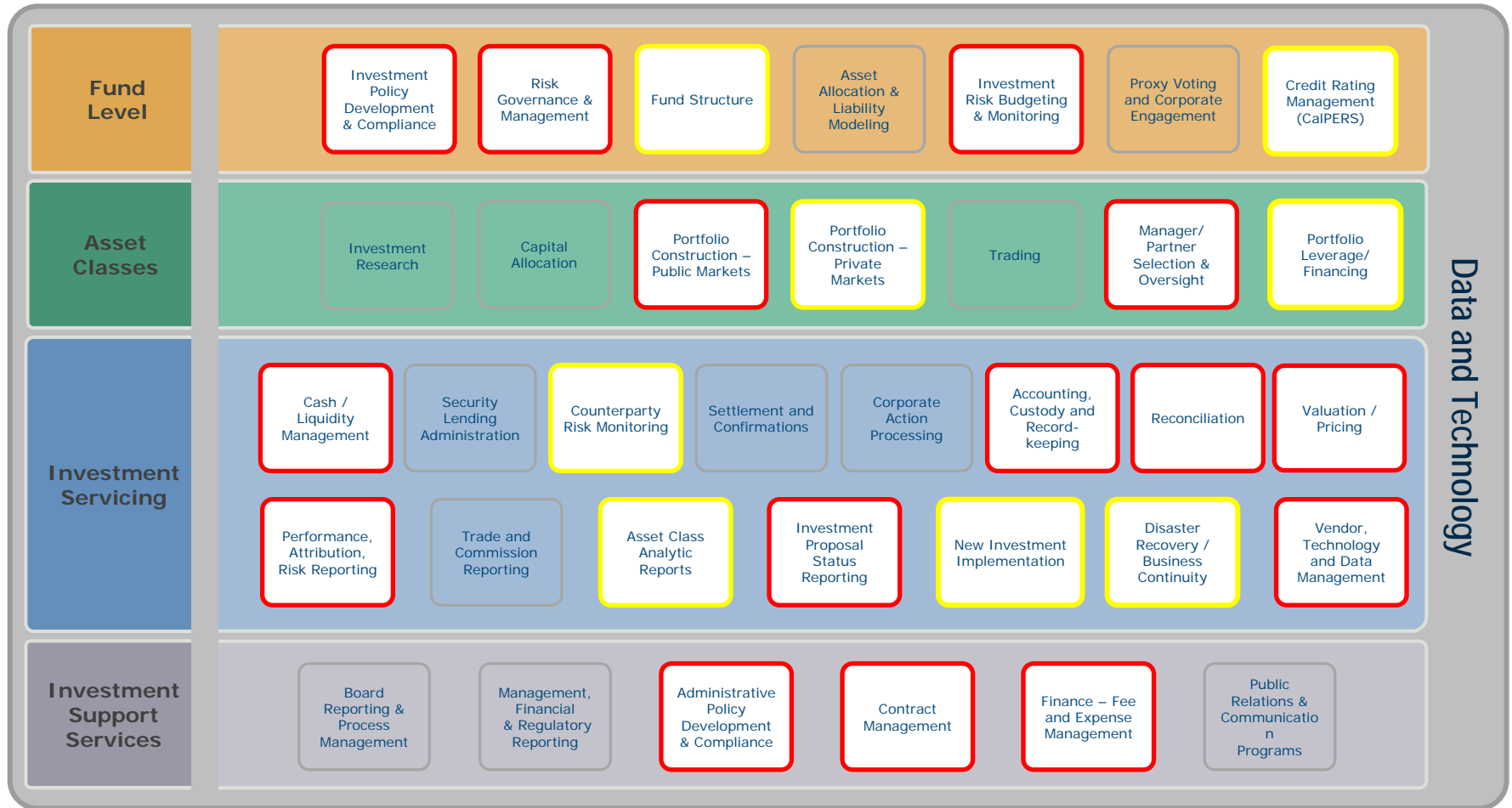


Provides a framework for making decisions about technology and roles of service providers

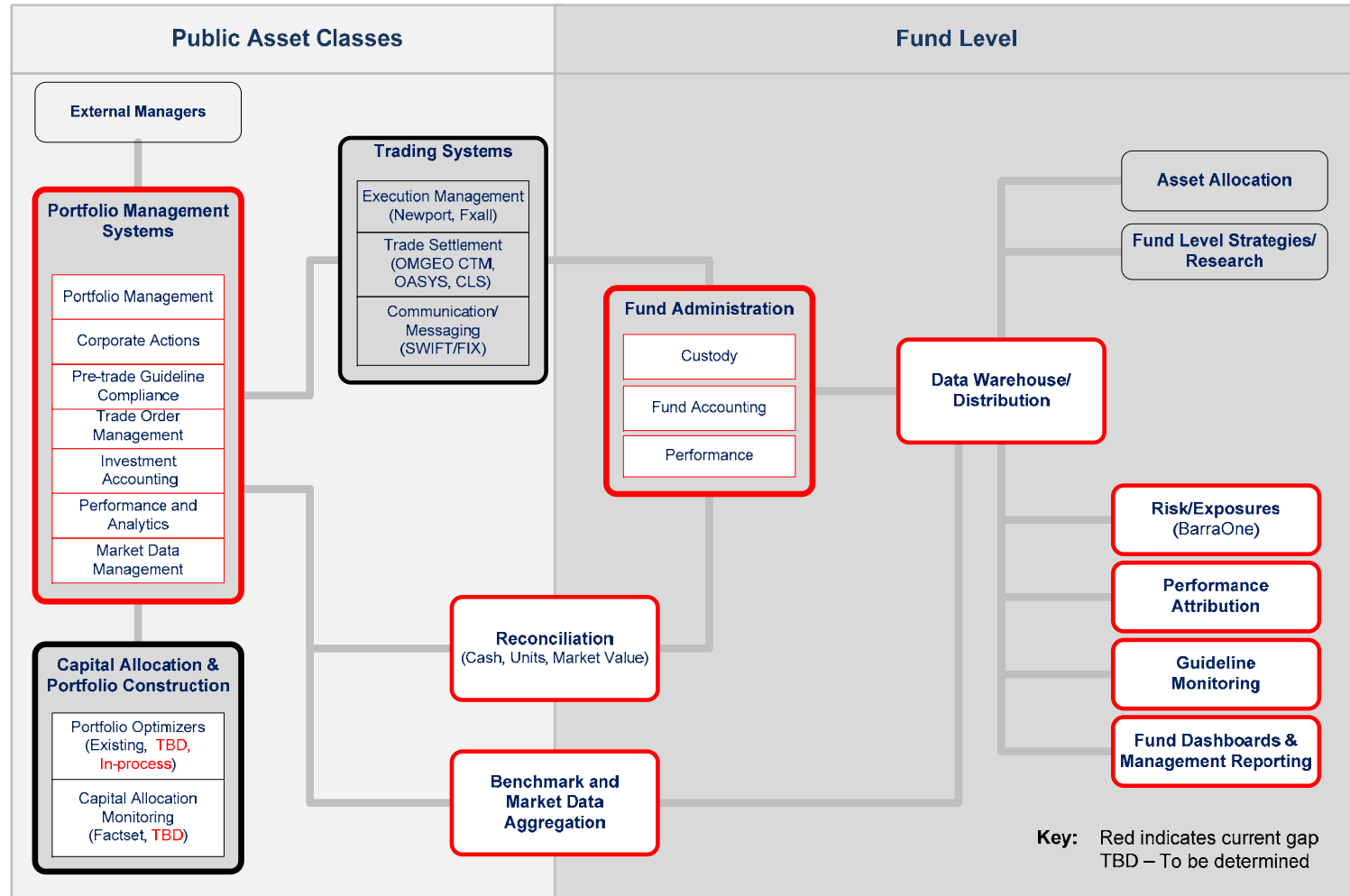
Standard Investment Functions



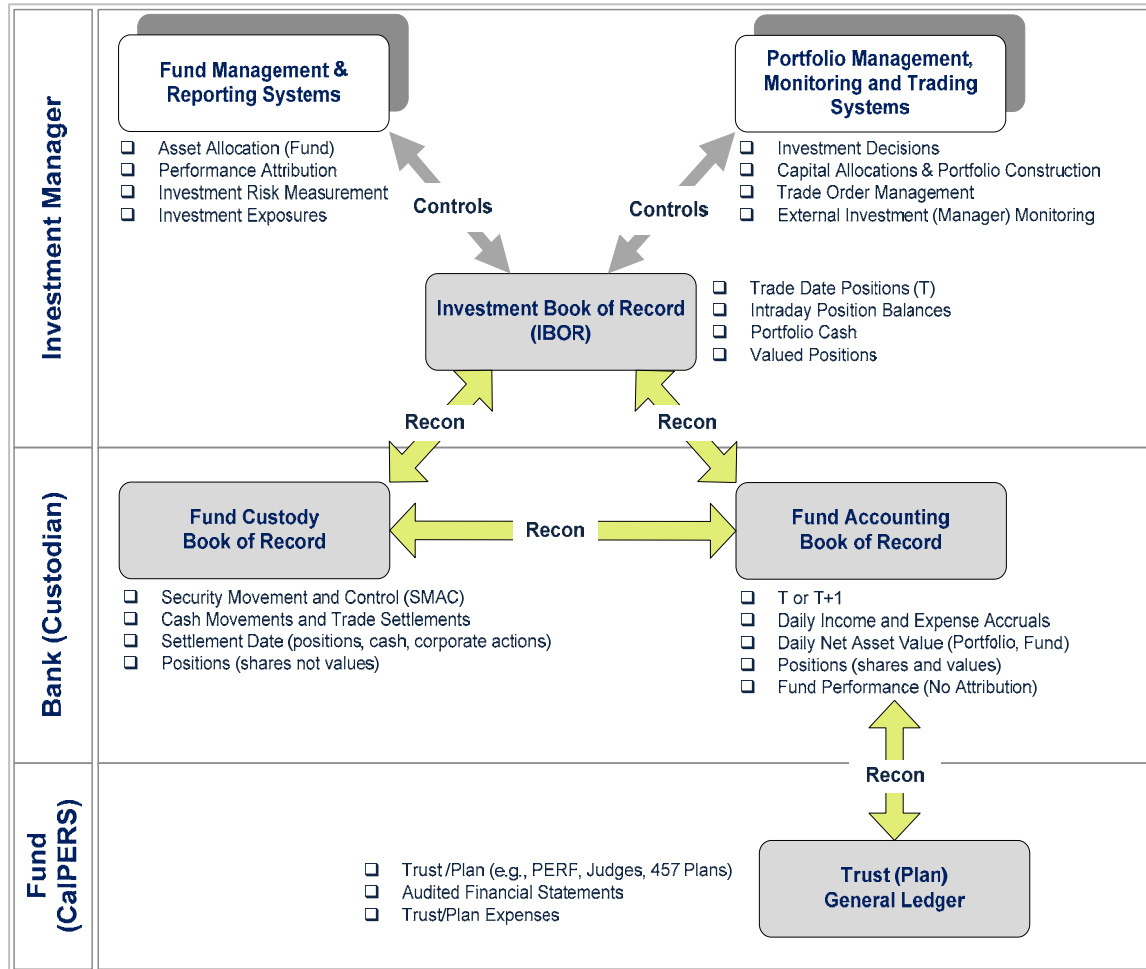
Investment Office Focus Areas



Technology – Public Markets Target Model



Technology – Target Model Books of Record

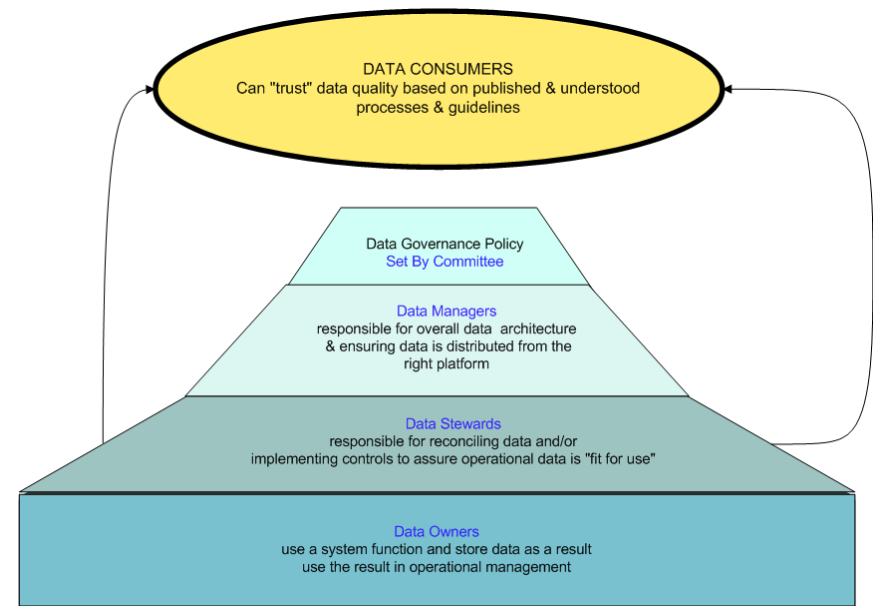


- ❑ **Define and Manage “Books of Record”**
 - ❑ Intended Use
 - ❑ Timeliness - Consider move to Trade Date (T) for Accounting
 - ❑ Accounting and Data Rules (Policies)
- ❑ **Future Investment Books of Record**
 - ❑ Trust G/L - Fiscal
 - ❑ Fund Accounting & Custody - Custodian
 - ❑ Public Markets – TBD
 - ❑ Real Estate – AREIS
 - ❑ ILAC - AREIS or ?
 - ❑ AIM - Private Edge or ?
- ❑ **Define Reconciliations & Control Points**
- ❑ **Manage (Oversee) Reconciliations**

Data Strategy

- Implement data governance program and processes
- Develop strong practices and associated “rules” for processing accounting data (e.g., closing of books, valuation, cancel/rebook, expense accrual, and NAV reprocessing)
- Eliminate duplicative performance reporting derived from different bases
- Define reconciliation processes for cash, positions, and market values
- Improve oversight of vendor reconciliation processes and establish quality standards
- Identify which data sources are appropriate for what uses, and by whom (“Gold Sources” of data)

Standard Roles and Accountabilities



Roadmap: Guiding Principles

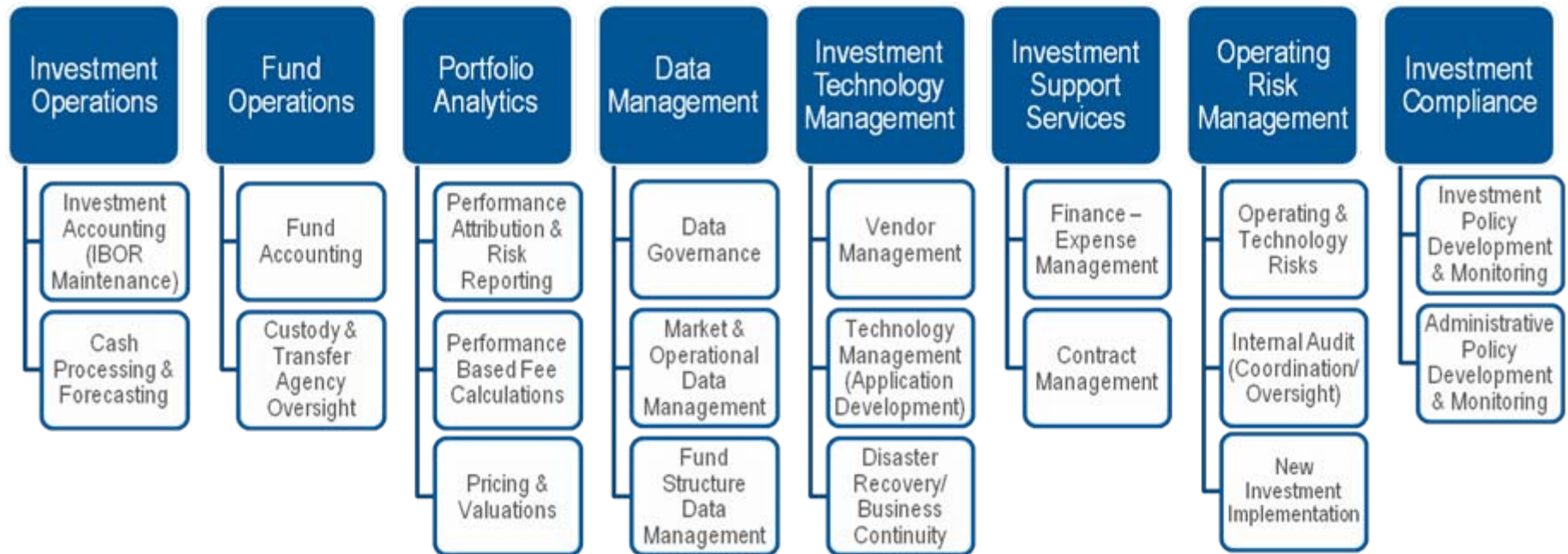
- Move to a daily trade date processing cycle to improve accuracy and timeliness
- Share/leverage common systems, data, vendors and operational solutions across asset classes
- Establish data standards and controls to ensure timeliness and accuracy of Books of Records
- Select outside investment support services to ensure staff focuses on higher value-add functions when:
 - Advantageous cost-benefit model
 - Service level agreements can be negotiated to manage outcomes
 - Vendor capabilities are superior and fit Investment Office's business model
- Establish formal accountabilities and processes for managing 3rd party service providers

Proposed Roadmap – Sequence of Major Initiatives

Initiative	2010	2011				2012				2013			
PM2: “Public Markets Portfolio Management” (formerly IEPC)	*												
Custody, Fund Accounting & Performance	*												
Investment Risk Management	*												
Contract & Vendor Management													
Administrative Policies & Monitoring													
Manager Selection & Monitoring													
Finance / Expense Management													
Operating Risk Governance & Management		*											
Fund Structure & Fund Expenses		*											
Investment Policy Development & Monitoring	*	*											
Public Records Request Procedures													
Cash / Liquidity Management	*	*	*										
Pricing / Valuation	*	*	*										
Technology Management	*	*	*										
Data Services (Governance)	*	*	*	*									
Private Assets IBOR & Accounting													
Performance Attribution & Analytics	*	*	*	*	*	*							
CRM - Salesforce Expansion													
Records Retention & Document Management													

* incremental and / or targeted work underway

Operations & Control Capability Needs



2011/12 Budget Request begins to address gaps

Next Steps

- **Implement 2011/12 Top Technology Priorities**
 - Public Markets portfolio management and Investment Book of Record
 - Public Markets fund accounting and custody
 - Investment risk management system
- **Internal Capabilities Needed → 2011/12 Budget Request**
- **Develop operating risk measures**
- **Fully develop and cost three-year plan**
 - Identify efficiency/funding opportunities

Appendix

- CalPERS Investment Office Risk Definitions & Rankings
- Definitions for Risk Ranking
 - Impact Criteria
 - Likelihood Criteria
- Proposed Objectives for Initiatives

CalPERS Investment Office Risk Definitions & Rankings

Rank	Risk Name	Risk Ranking
1	Data Integrity: <i>Lack of timely, reliable and high-quality data to perform analyses and drive appropriate action and decisions</i>	18.9
2	Portfolio Data & Analytics : <i>Lack of data, information or insight concerning existing or potential holdings (public or private) needed to support capital allocation decisions and monitoring of portfolio performance</i>	18.9
3	Control Environment: <i>Violation of existing policy by employees or partners; or lack of processes or procedures to ensure compliance with existing policies; or lack of appropriate separation of duties and effective controls in operating processes</i>	18.1
4	External Manager / Partner Selection, Monitoring & Rights: <i>Inability to select, oversee and structure contracts and incentives with external managers to deliver results that satisfy the organization's objectives and allow for mitigation of potential investment risks</i>	17.6
5	Governance / Stakeholder Support : <i>Inability to align key stakeholders (e.g., management, Board, members, CalPERS enterprise, and consultants) around strategic objectives for Investment Office and to ensure stakeholder support for the execution of those objectives</i>	17.6
6	Market / Systemic: <i>Significant and / or unexpected change in investment performance driven by market factors</i>	17.5
7	Investment Decision Process: <i>Lack of a comprehensive investment decision making framework and process that ensures appropriate cross-functional discussion, input, action, and review and that delineates clear and consistent roles and responsibilities</i>	16.8
8	External Influence: <i>Lack of ability to execute activities that support long-term strategic goals and investment performance objectives due to undue influence by or potential influence by external stakeholders</i>	16.8
9	Business Model: <i>Inability, as a state agency, to operate, compete and build a reputation as a world class investment manager</i>	16.4
10	Skills & Capabilities: <i>Lack of key business, investment management and / or technical expertise necessary to run the organization and ensure the appropriate division of in-house vs. outsourcing of skills, functions and expertise</i>	16.4
11	IT Infrastructure Adequacy: <i>Lack of appropriate, integrated information management systems to support timely and accurate collection / analysis of data and execution of business processes</i>	16.0
12	Leadership / Direction: <i>Inability to maintain clear and consistent direction from senior management regarding key priorities, activities and objectives; inability to implement functioning, governance / decision-making structure within Investment Office</i>	16.0

CalPERS Investment Office Risk Definitions & Rankings

Rank	Risk Name	Risk Ranking
13	Asset Allocation Strategy / Portfolio Structure: <i>Lack of ability to effectively and advantageously execute timely strategic and tactical asset allocation decisions that improve fund performance and reduce volatility</i>	15.9
14	Recruiting & Retention: <i>Inability to identify, attract, select, hire and retain appropriately skilled and experienced employees to execute the organization's activities and maintain a stable workforce</i>	15.2
15	Liquidity: <i>Inability to generate, maintain or access capital necessary to fund operations and meet obligations in either the short term (e.g. capital calls) or long term (e.g. retirement benefits); including the inability to convert certain investments to cash without significant loss of value</i>	13.9
16	Incentive Alignment: <i>Misalignment of individual and/or team (internal) performance expectations with the overall goals and performance objectives of the organization, portfolio or system</i>	12.6
17	Contract Management: <i>Inability to identify, catalog and manage contractual agreements in a consistent and effective manner in order to ensure compliance and monitor vendor performance</i>	12.2
18	Funding Status: <i>Cessation of or significant change to the current defined benefit pension system in California</i>	11.5
19	Ethics / Fraud: <i>Improper behavior or unlawful action taken in pursuit of personal gain by employee(s) or others associated with or acting on behalf of the organization</i>	10.9
20	Institutional Knowledge: <i>Inability to design, maintain and execute processes and systems to ensure the documentation, transfer and institutionalization of business activities to ensure consistency and sustainability of operations</i>	10.1
21	Interest Rates: <i>Significant and / or unexpected change in interest rates associated with the organization's existing assets</i>	9.3
22	Counterparty: <i>Default on existing obligations by financial intermediaries (e.g. brokers, banks, fund managers), suppliers or bond issuers</i>	8.0
23	Currency / Foreign Exchange: <i>Significant and / or unexpected change in the value of the US dollar relative to foreign currencies held in or affecting the portfolio's other investments</i>	7.3

Definitions for Risk Ranking

Rating	IMPACT CRITERIA		
5 <i>Critical</i>	<ul style="list-style-type: none"> • >50 bps (> \$1BN) 	<ul style="list-style-type: none"> • Significant Stakeholder Reaction • Loss of Key Investment Opportunities • Intl / National Press Coverage • Sudden Loss of Multiple Investment Office Leaders 	<ul style="list-style-type: none"> • Federal / State Action • Significant Legal Penalty • Loss of Tax-Exempt Status • Breach of Fiduciary Duties
4 <i>Major</i>	<ul style="list-style-type: none"> • 30-50 bps (\$600MM-1BN) 		
3 <i>Moderate</i>	<ul style="list-style-type: none"> • 10-30 bps (\$200MM-600MM) 	<ul style="list-style-type: none"> • Increased Stakeholder Scrutiny • Limitations in Investment Opportunities • Regional Press Coverage • Loss of Key Investment Professionals 	<ul style="list-style-type: none"> • Federal / State Scrutiny • Modest Legal Penalty • Potential Breach of Fiduciary Duties
2 <i>Minor</i>	<ul style="list-style-type: none"> • 1-10 bps (\$20-200MM) 		
1 <i>Insignificant</i>	<ul style="list-style-type: none"> • <1 bps (< \$20MM) 	<ul style="list-style-type: none"> • Limited Stakeholder Interest / Inquiry • Minimal (If Any) Opportunity Impact • Limited (If Any) Press Coverage 	<ul style="list-style-type: none"> • No Federal / State Scrutiny • No Legal Penalty • No Breach of Fiduciary Duties

Definitions for Risk Ranking

Rating	LIKELIHOOD CRITERIA
5 <i>Likely</i>	<ul style="list-style-type: none"> • Already occurring or expected to occur within the time horizon (1-2 years) • Controls either are not working or may not exist • Risk affects a HIGH number of transactions, processes and systems • Limited staff to address risk; staff available has limited competency to address risk
4	
3 <i>Potential</i>	<ul style="list-style-type: none"> • May occur within the time horizon (1-2 years) • Controls may not be preventative but are detective • Risk affects a MEDIUM number of transactions, processes and systems • Limited staff to address risk; staff available has some competency to address risk
2	
1 <i>Unlikely</i>	<ul style="list-style-type: none"> • Not expected to occur within the time horizon (1-2 years) • Controls are appropriately preventative and detective • Risk affects a LOW number of transactions, processes and systems • Staff in place to address risk; staff available has high competency to address risk

Proposed Objectives for Initiatives

Initiative	Priority	Scope and Objectives
PM ² : “Public Markets Portfolio Management” (formerly IEPC)	High	<ul style="list-style-type: none"> Implement accounting and portfolio management solution for Internal Equity and External Managers Establish an Investment Book of Record for Public Assets and Portfolio Management and Monitoring
Custody, Fund Accounting & Performance	High	<ul style="list-style-type: none"> Improve Custodian service levels Improve Fund Accounting service levels including upgrade to T/T+1 NAVs Improve Fund Performance reporting services Establish Investment Office oversight roles and responsibilities to manage services
Investment Risk Management	High	<ul style="list-style-type: none"> Implement BarraOne as a Fund Risk measurement solution Vet the capabilities of BarraOne to adequately reflect risk in Private Asset Classes; consider complementary solutions
Contract & Vendor Management	High	<ul style="list-style-type: none"> Define contracting procedures & standards for external investment (money) managers to reduce effort and elapsed time Develop capabilities to manage external service providers (e.g., custodian, analytic services, market data) to align service levels with Investment Office needs and control costs
Administrative Policies and Monitoring	High	<ul style="list-style-type: none"> Establish administrative policies (e.g., travel, expense, contracting) and procedures that are efficient and aligned with Investment Office functions and objectives (e.g., manager monitoring, training)
Manager Selection and Monitoring	High	<ul style="list-style-type: none"> Establish Investment Office-wide standards for managing external managers (selection, deal negotiation, monitoring) including performance objectives (MBOs)
Operating Risk Governance & Management	High	<ul style="list-style-type: none"> Establish a Risk Governance and Management program to assure operating risks are identified and remediated
Fund Structure & Fund Expenses	Medium	<ul style="list-style-type: none"> Revise the structure of PERF and Affiliate funds to standardize and deliver effective portfolio management, custody, fund accounting and transfer agent services Define policies and procedures for ensuring appropriate recognition of fund expenses

Proposed Objectives for Initiatives

Initiative	Priority	Scope and Objectives
Investment Policy Development and Monitoring	High	<ul style="list-style-type: none"> Establish investment policy monitoring processes that assure internal and external managers conform with investment guidelines
Finance / Expense Management	High	<ul style="list-style-type: none"> Implement a finance/expense management solution to ensure effective management of Investment Office expense budgets
Public Records Request Procedures	Medium	<ul style="list-style-type: none"> Improve/establish policies and procedures to respond to Public Record Act (PRA) requests
Cash / Liquidity Management	Medium	<ul style="list-style-type: none"> Define policies and implement procedures for processing cash movements and for cash forecasting to assure accuracy and better manage fund liquidity Explore use of Aladdin for cash management
Pricing / Valuation	Medium	<ul style="list-style-type: none"> Establish a pricing/valuation function to assure Investment Office valuations conform to the basis used for representing fair value and performance reporting
Technology Management	High	<ul style="list-style-type: none"> Establish a technology management function to assure technology services supplied by CalPERS and vendors are effective
Data Services (Governance)	High	<ul style="list-style-type: none"> Establish a Data Governance and Data Management Function to assure the integrity and availability of investment data and manage costs (e.g., SEDOL, CUSIP, market data) - Refer to Data Strategy
Private Assets IBOR (Investment Book of Record) and Accounting	Medium	<ul style="list-style-type: none"> Evaluate alternatives for AIM (e.g., LP Capital, Private Edge) and ILAC for portfolio monitoring Implement (upgrade) Investment Book of Record (IBOR) and portfolio monitoring tools for AIM and ILAC
Performance Attribution and Analytics	High	<ul style="list-style-type: none"> Implement a performance attribution solution Manage the delivery and support of other investment analytics (e.g., Risk Measurement, Fixed Income Analytics, Exposures)
CRM – Salesforce Expansion	Medium	<ul style="list-style-type: none"> Deploy Salesforce as an Investment Office standard for Contact/Client Relationship Management (CRM)
Records Retention and Document Management	Medium	<ul style="list-style-type: none"> Establish policies and procedures for defining “records” and managing archival Implement a document management solutions